

REMARKS/ARGUMENTS

This paper is submitted responsive to the Office Action mailed February 25, 2009, and accompanies a Request for Continued Examination (RCE). Reconsideration of this application in light of the accompanying remarks and amendments is courteously solicited.

In the office action, the Examiner declined consideration of two references listed in the IDS filed February 17, 2009. This IDS is resubmitted herewith and consideration of the art cited therein is respectfully solicited.

The Examiner objected to claim 19 as being a substantial duplicate of claim 16. The Examiner cited MPEP section 706.03 stating that "[w]hen two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim.

While the applicant does not at all concede that claims 16 and 19 are "substantial duplicates", it is also noted that the language of MPEP 706.03, as stated above, applies when one of the two claims is allowed, and this has not happened. Thus, withdrawal of this rejection is requested.

Claims 10, 15, 17, 18 and 20 were rejected under 35 USC 103(a) as obvious based upon a combination of newly cited US patent 5,303,272 to Oyama et al. in view of Yoon et al (US 20030012329). Reconsideration of this rejection is earnestly solicited. By the present paper, claim 15 has been amended to recite the subject matter shown in Figure 6 as it relates to the spring structure. Specifically, claim 15 calls for the inner rod support part 22 to have at least two steps along vertical bending lines. These are the steps shown in Figure 6 between the two spaced vertical support parts 21 and the curved portion

of the inner fuel rod support part 22. This feature is totally absent from any art of record. Claim 15 also further defines the structure of the two spaced vertical support parts (21, Figure 6), and this feature is also not disclosed or suggested by any art of record. On this point, it is noted that Oyama in Figure 11 does not show vertical support parts connected between top and bottom edges of the opening.

Dependent claims 10-14 and 16-20 all depend directly or indirectly from claim 15 and are believed patentable based upon this dependency.

Dependent claim 20 still further defines the structure of the two spaced vertical support parts 21, and this feature is likewise not present in the art of record.

With respect to claims 16 and 19, the Examiner further relied upon Mayet et al and Foulds et al. The Examiner referred to col.1, lines 23-27 of Mayet et al, which merely discloses that Zircaloy-4 is the material of the strap which is subjected to a high level of neutron flux. Also, the Examiner cited col.7, lines 10-16 of DeMario et al, and this merely discloses Zircaloy-4 as the material of the fuel pellets (not the spring part). Finally, the Examiner cited col.9, line 61-col.10, line 8 of Foulds et al, and this merely discloses the spring constant of support of the two type fuel rods being Zircaloy tubing and steel tubing. Thus, these three teachings are far short of the subject matter of claims 16 and 19, and the Examiner has supplied far too little of this rejection from the actual teachings of the prior art.

It is submitted that the combination relied upon by the Examiner does not teach the claimed vertical support part of the outer grid spring having a higher strength than the inner support part of the inner spring as called for in claims 16 and 19. Further, the claimed subject matter efficiently supports

cross flows of the coolant which is loaded maximum load on the perimeter strips.

With respect to claims 11, 12 and 14, the Examiner has relied upon the additional teachings of Oh et al, De Mario et al and Nguyen et al to reject these claims. The Examiner refers to col.7, lines 1-14 of Oh et al, but this teaching is totally different from the guide tap of claims 11, 12, and 14, since Oh et al. disclose only swirl flow vanes which have different height for reducing the pressure loss and enhancing the mixing flow (referring to col.7, lines 15-23 of Oh et al). Oh et al. do not disclose a guide tap for reducing interference between the fuel rods and the spacer grid during an insertion or removal of the fuel rods into or from the reactor core (see paragraph [0015] of the present specification).

The Examiner cited Fig. 3, col.5, lines 19-24, col. 8, lines 28-34 of DeMario et al in this rejection, but this teaching is totally different from claims 11, 12 and 14, since it DeMario discloses only mixing vanes for enhancing heat flux(referring to col.5, lines 19-24).

The Examiner cited Figs. 1 and 2, col.5, line 10-43 of Nguyen et al, but this too is totally different from claims 11, 12 and 14, since Nguyen also discloses only mixing vanes for balancing the hydraulic force and enhancing the mixing flow (referring to the last part of abstract of the Nguyen et al.).

It is also noted that these claims call for an alternating sequence of guide taps and vanes along the upper edge of the perimeter strips. Nothing in any of the cite secondary references teaches this, as evidenced for example by the round structure shown in Oh et al. Figure 9 relied upon by the Examiner. In other words, Oh et al. and all other art of record is silent as to an alternating structure on the upper edge of the perimeter of the spacer grid.

Consequently, none of the art of record teaches a guide tap for reducing interference between the fuel rods and the spacer grid during an insertion or removal of claims 11, 12, and 14, and these claims are believed to define additional allowable subject matter.

New claims 21-26 have been added to further define the patentable features of the present invention.

New claim 21 is an independent claim corresponding roughly to a combination of claims 15, 11, 12 and 16. Support for this claim comes from those claims themselves as well as the specification and drawings, and no new matter has been added. The Examiner had made an issue concerning the recitation of "a center of the spacer grid" and this language is also in new claim 21. It is noted that despite the Examiner's assertions, the spacer grid has only one center and this is the point defined by an intersection of lines drawn from pairs of opposite corners. The suggestion that each cell has a center, while true, is irrelevant to the center of the spacer grid. Centers of individual cells within the spacer grid are not themselves centers of the spacer grid. Likewise, the number of cells in the grid is irrelevant to the center, as the center of the spacer grid need not coincide with the center of any particular cell. The claim language is clear and definite, and proper consideration of this claim is respectfully solicited.

New dependent claims 22-24 have been added and further highlight the different structures of the guide vanes, guide taps and mixing blades of the present invention. Specific structure of the guide taps versus the guide vanes is also recited. Support for this subject matter is present at least in figures 3a, 3b, 5b, 6, 7a, 7b and 8. No new matter has been added. These claims further recite the key structural differences between the guide vanes and guide taps that provide

the important function of the invention to allow rods to be inserted to and removed from the grid with reduced interference. Nothing in the art of record discloses or suggests the different shapes of these components as claimed, and claims 22-24 are submitted to be allowable due to their dependency from claim 21 and also in their own right.

New independent claim 25 even further highlights patentable features of the present invention, and recites subject matter similar to claim 21, with additional definition of the center of the spacer grid, albeit such additional definition is not believed to be necessary. This claim is believed to be allowable for the reasons set forth above in support of the different spring strengths and structures as well as specific combination of guide taps and guide vanes.

Finally, new claim 26 has been added to further recite additional structural features of the guide taps and guide vanes, specifically with respect to the different curved shapes of the two. Claim 26 calls for the radius of the curved end of the guide vane to be shorter than the radius of the arc-shaped edge of the guide tap. Support for this is clearly found in the drawings, see for example Figure 8.

An earnest and thorough attempt has been made by the undersigned to resolve the outstanding issues in this case and place same in condition for allowance. If the Examiner has any questions or feels that a telephone or personal interview would be helpful in resolving any outstanding issues which remain in this application after consideration of this amendment, the Examiner is courteously invited to telephone the undersigned and the same would be gratefully appreciated.

It is submitted that the claims as pending herein patentably define over the art relied on by the Examiner and early allowance of same is courteously solicited.

It is believed that no fee is due in connection with this response. If any fees are required, please charge same to Deposit Account No. 02-0184.

Respectfully submitted,
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